

Salmonella and Reptiles

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As of June 25, 14 *Salmonella* infections linked with exposures to reptiles or amphibians have been reported to the Indiana State Department of Health during 2004. Sixty-four percent of the cases have occurred in children ages 10 and under. Twenty-one percent of the cases occurred in children **less than 3 months of age**. Five cases had exposures to turtles, seven to lizards, three to snakes, and one to a salamander (some cases were exposed to more than one species). While the associations were not proven to be the source of infection, the history of the exposures direct handling of the animals, the animals' access to food preparation areas or other surfaces that could have been contaminated with the animals' fecal material suggests that animals may have been the source of infection.



Salmonella bacteria are spread by contact with feces of infected persons and animals, including poultry, cattle, swine and reptiles. Symptoms appear approximately 6 to 72 hours after exposure and include diarrhea; stomach cramps; fever; and, sometimes, bloody stools. Rarely, systemic infections affecting major body organs occur and can cause death.

At least 35 *Salmonella* serotypes have been associated with reptiles. The fact that reptiles pose a *Salmonella* infection threat to humans was recognized as far back as 1963 when turtle-associated salmonellosis of humans was first identified. Because of this association with *Salmonella*, the ban on the sale of pet turtles (see sidebar article in the June 2004 issue of the *Indiana Epidemiology Newsletter*) was enacted. A 77% reduction in human cases of *Salmonella* infections associated with turtles and an 18% reduction in *Salmonella* infections in children ages 1 to 9 occurred after implementation of the ban, thus illustrating the impact of turtle-associated salmonellosis.

Since the pet turtle bans began, transmission of *Salmonella* from other reptiles (pet iguanas, snakes, and lizards) has also been documented. Reptiles can be asymptomatic carriers of *Salmonella* and have been found to be carriers when captured in the wild. Captured lizards have had asymptomatic carriage rates up to 77%. Opportunities for transmission between reptiles and increasing the carriage rate can occur at several points where reptiles are collected for the pet trade, such as reptile breeding farms.

Reptiles are popular pets. Over two million households in the U.S. own iguanas, but often their owners do not recognize the associated risk. Transmission of *Salmonella* from pets to humans can occur from handling the animal or from allowing the animal to roam freely about the home with fecally contaminated feet depositing *Salmonella* organisms on surfaces that humans, especially children, may handle.

Recognizing the risk of *Salmonella* transmission and the impossibility of ensuring the elimination of *Salmonella* from reptile intestinal tracks, the Association of Reptilian and Amphibian Veterinarians has developed the following guidelines for owners of pet reptiles:

- Always wash your hands with hot soapy water after handling reptiles, reptile cases and equipment, and stool from reptiles.
- Do not allow reptiles to have access to the kitchen, dining room, or any other area where food is prepared.
- Do not allow reptiles to have access to bathroom sinks and bathtubs or to any area where infants are bathed.
- Wash hands after touching areas where reptiles are allowed to roam freely.
- Do not eat, drink, or smoke while handling reptiles, reptile cages, or equipment.
- Do not kiss reptiles or share food or drink with them.
- Do not use the kitchen sink, kitchen counter, bathroom sink or bathtub to bathe reptiles or to clean their cages and equipment. A dedicated plastic tub or other container should be purchased for these purposes. Dispose of any associated wastewater and fecal material in the toilet.
- Reptile owners should discuss with their veterinarian the proper diet and environment to maintain the reptile's health. Healthy reptiles are less likely to shed *Salmonella*.

The U.S. Centers for Disease Control and Prevention offers these additional recommendations on reptiles as pets:

- Reptiles should not be kept in households with children under 1 year of age, and children less than 5 years of age should not have contact with reptiles.
- Daycare facilities should not maintain reptiles as pets or exhibits.
- Immunocompromised individuals should not have reptiles as pets.

The risk of contracting *Salmonella* can be greatly reduced by following the above guidelines. Individuals who have questions concerning their health and the risk of salmonellosis should consult their physician. Individuals with questions concerning the management of their pet reptiles should consult their veterinarian.

References:

1. Ackman, Drabkin, Birkhead, Cieslak; Reptile-associated salmonellosis in New York State; Pediatric Infectious Disease Journal, 1995; 955-9
 2. Association of Reptilian and Amphibian Veterinarians Client Education Handout; Salmonella bacteria and reptiles; JAVMA, page 52, Vol 213, No.1, July 1, 1998
 3. Chiodini, Sundberg, Salmonellosis in Reptiles: A Review; American Journal Epidemiology, page 494-499, Vol.113. No. 5, 1981
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